



New records for the Peruvian high-altitude diving beetle *Rhantus blancasi* Guignot, 1955 (Coleoptera, Dytiscidae, Colymbetinae)

Michael Balke¹, Yoandri Suarez-Megna², Lars Hendrich¹, Nilver Zenteno³, Luis Figueroa³

1 SNSB-Zoologische Staatssammlung, Münchhausenstrasse 21, D-81247 München, Germany. **2** Departamento de Biología, Universidad de Oriente. Patricio Lumumba s/n, Santiago, Santiago de Cuba, Cuba. **3** Departamento de Entomología, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Avenida Arenales 1256, Jesús María 15072, Lima, Perú.

Corresponding author: Michael Balke, balke@snsb.de

Abstract

The diving beetle *Rhantus blancasi* Guignot, 1955 (Coleoptera, Dytiscidae, Colymbetinae) was until now only known from older reports from Pasco region, Peru. Here, we provide new distributional data from Cuzco and Junin regions, habitat information, and illustrations of diagnostic characters for the easy identification of the species.

Keywords

Aquatic Coleoptera, high-altitude lakes, South America, taxonomy.

Academic editor: Rafael Benzi Braga | Received 1 August 2019 | Accepted 20 September 2019 | Published 18 October 2019

Citation: Balke M, Suarez-Megna Y, Hendrich L, Zenteno N, Figueroa L (2019) New records for the Peruvian high-altitude diving beetle *Rhantus blancasi* Guignot, 1955 (Coleoptera, Dytiscidae, Colymbetinae). Check List 15 (5): 941–944. <https://doi.org/10.15560/15.5.941>

Introduction

Diving beetles (Coleoptera, Dytiscidae) are a comparably well-known group of beetles. There are about 4,500 known species (Nilsson and Hajek 2019), occupying a large variety of aquatic habitats including ground water, rivers and streams, peat bogs, hypersaline as well as hygroscopic habitats, ponds, puddles, and lakes. They can easily be collected, and are often used as a study group for ecological, conservation, and biogeographic and evolutionary research (Balke and Hendrich 2016; Miller and Bergsten 2016). Diving beetles are also abundant predators in lentic tropical alpine ecosystems, reaching altitudes up to 5,100 m in the Himalayas (Bran-cucci and Hendrich 2006). One major global group of tropical alpine diving beetles belongs to the genus *Rhantus* Dejean, 1833 (subfamily Colymbetinae). There are 93 species in the world (Nilsson and Hajek 2019; Balke et al. 2019, in press). Their evolution and biogeographic

history was studied based on a comprehensively sampled molecular phylogeny, and so was the evolution of enigmatic Neotropical lineages (Morinière et al. 2015, 2016). This work also led to a reclassification of species formerly included in *Rhantus* (Balke et al. 2017). The Neotropical high-altitude fauna was inferred as originating from cold-adapted colonisers from the Holarctic. However, biogeographic patterns within the Andes remain little known. For that reason, more effort has to be directed to the study of Andean high-altitude ecosystems, which are threatened by intensifying land use, mining, and possibly global warming. In the context of such work, we have discovered new localities for the Peruvian high-altitude diving beetle *Rhantus blancasi* Guignot, which was described in 1955 and only known from the type material. These are presented here, and, for the first time, photographs of the species' habitat and morphological characters.

Methods

This work was authorized by SERFOR (Servicio Nacional Forestal y de Fauna Silvestre del Ministerio de Agricultura y Riego). The beetles were studied with a Leica M205C stereo microscope at 10–160 \times . Habitus images were taken with a Canon EOS 5DS camera fitted with the Canon MPE65 macro lens, attached to a Stackmaster macro rail (Stonemaster: <https://www.stonemaster-onlineshop.de/>). For photographs of genitalia and the claws we used a 10 \times Mitutoyo ELWD Plan Apo objective attached to a Carl Zeiss Jena Sonnar 3.5, 135 MC as focus lens. Illumination was with three to four LED segments SN-1 from Stonemaster. Image stacks were generated using the Stackmaster macro rail, and images were then assembled with the computer software Helicon Focus 4.77. The map was created with primap MapCreator 3.0, Professional Edition.

Voucher specimens are stored in Natural History Museum of San Marcos University, Lima, Peru (MUSM) as well as SNSB-Zoologische Staatssammlung, München, Germany (ZSM).

Results

Rhantus blancasi Guignot, 1955

Rhantus blancasi Guignot 1955: 10 (original description); Balke 1992: 31 (redescription); Nilsson and Hájek 2019: 42 (catalogue).

Type locality and type collecting data. Peru, Pasco Region, Pasco Province, Cerro de Pasco, Naticocha Lagoon, near Huarón (taken from GoogleEarth: -11.032° , -76.452°), 4,600 m, July 1949, collector: Fortunato Blancas Sánchez.

New records. PERU • 2 individuals; Junin Region, Jauja Province, Jauja, Tragadero Lagoon, -11.767° , -75.532° ; 3,460 m, 04 Aug. 2018, Y.S. Megna & N. Zenteno, PER_YM_2018_03, DNA barcoding vouchers MB 8073 and 8074 • 5 individuals, Cuzco Region, Canchis Province, Canchis, Checacupe, Cayena, -13.981° , -71.068° , 4,850 m, 25 Aug. 2018, Y.S. Megna & N. Zenteno, PER_YM_2018_27, DNA barcoding vouchers MB 8213 to 8217.

This species was collected from the margin of permanent lakes, with muddy bottom and with abundant aquatic vegetation (Fig. 1). It was associated with other dytiscid species, *Liodesmus* sp., *Lancetes* sp., and *Rhantus* sp. (we did not further identify these pending revisionary taxonomic work), as well as the hydrophilid *Tropisternus* sp.

Identification. The species was identified based on previous study of the holotype (in the Muséum National d'Histoire Naturelle Paris: Balke 1992). There is a second specimen in MUSM with the same label data as the holotype, and with a typewriter written label “Rhantus



Figure 1. *Rhantus blancasi*. Habitat, above the locality Junin Region, Jauja Province, Tragadero Lagoon, below Canchis, Checacupe, Cayena.

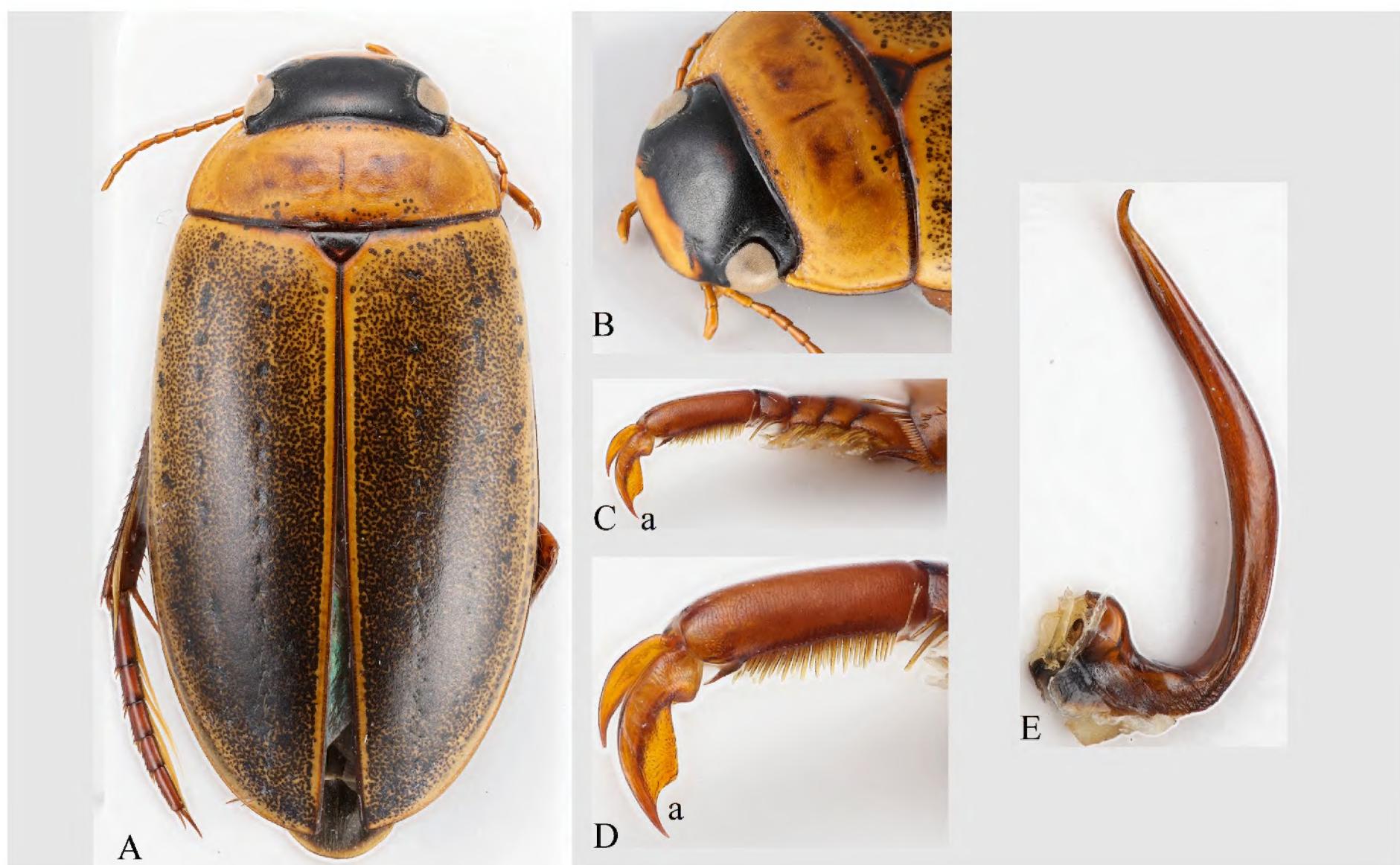


Figure 2. *Rhantus blancasi*. **A.** Habitus dorsal, length of beetle 10.5 mm. **B.** Head and pronotum, frontal-lateral view. **C.** Protarsus male (a = anterior claw). **D.** Male protarsomere V and protarsal claws in detail. **E.** Median lobe of aedeagus in lateral view.

Blancasi n.sp.” and a handwritten label with inventory number “MHN 4203”. This specimen is obviously from the same collecting event as the holotype, but was not mentioned by Guignot (1955) in his original description of the species.

Rhantus blancasi belongs to the *Rhantus crypticus* group, with the other species being *R. vicinus* (Aubé, 1838) from Colombia and *R. crypticus* Balke, 1992 from Ecuador and Colombia (see Balke et al. 2019b for color images of taxonomically relevant characters). *Rhantus blancasi* can easily be separated from all other 93 *Rhantus* species in the world by the following combination of characters (Fig. 2A–E): pronotum mostly yellow; head black except for yellow clypeal region and dark orange frontal spot; fore claws of male of unique shape, anterior claw with large “tooth” and posterior claw much shorter and evenly curved; median lobe of aedeagus with conspicuous ventrally bent apical “hook” in lateral view.

Discussion

Rhantus blancasi was described from Pasco Region. We present new records for Cuzco and Junin regions (Fig. 3). Interestingly, the species was not mentioned in the checklist of aquatic beetles from Cuzco by Bustamante (2018). The new locality in Junin region is c. 130 km from the type locality, and the new locality in Cuzco Region c. 670 km, so that this species can now be said to have a wider range across the Peruvian Andes. Future fieldwork will be needed to discover if *R. blancasi* is indeed endemic in Peru, or possibly also occurs in neighboring Bolivia.



Figure 3. *Rhantus blancasi*. Distribution across Peru. **1.** Type locality, Pasco, Natichocha Lagoon. **2.** Junin Region, Jauja Province Tragadero Lagoon. **3.** Cuzco Region, Checacupe, Cayena. Map created with primap MapCreator 3.0, Professional Edition.

Acknowledgements

This work was supported by the Alexander von Humboldt Foundation (Ref 3.2 - 1161268 - CUB - GFHERMES-P) through a HERMES fellowship to Y.S. Megna. We thank Juliane Diller, Luis Figueroa, Gerardo Lamas, and Pavel Matos for their help with planning our work in Peru. We thank SERFOR (Servicio Nacional Forestal y de Fauna Silvestre del Ministerio de Agricultura y Riego) for authorizing this research, which was conducted in cooperation with the Natural History Museum of San Marcos University, Lima, Peru (MUSM) (Permit number 419-2017-SERFOR/DGGSPFFS and 003339-SERFOR for exportation).

Finally, we are grateful for the generous support from the SNSB-Innovative scheme, funded by the Bayerisches Staatsministerium für Wissenschaft und Kunst (Project: “Geographische Isolation, Endemismus und Artbildungsprozesse bei Insekten in der hochmontanen Páramo Kolumbiens (und darüber hinaus)”).

Authors' Contributions

MB and LH identified the species and wrote the manuscript. NZ and YSM organized fieldwork and collected the specimens. NZ studied the historical specimen in the MUSM collection. YSM, LF, NZ, and MB coordinated the research and revised the manuscript. All authors corrected, revised, and discussed the data.

References

Balke M (1992) Taxonomische Untersuchungen an neotropischen Wasserläfern der Gattung *Rhantus* Dejean. *Reichenbachia* 29: 27–39.

Balke M, Hendrich L (2016) Dytiscidae Leach 1915. In: Kristensen NP, Beutel RG (Eds), Beutel RG, Leschen RAB (vol. Eds) Coleoptera, Vol. 1: Morphology and systematics (Archostemata, Adephaga, Myxophaga, Polyphaga (partim). Handbook of zoology vol. IV, Arthropoda: Insecta, 2nd edition. Walter De Gruyter, Berlin, New York, 118–140.

Balke M, Hájek J, Hendrich L (2017) Generic reclassification of species formerly included in *Rhantus* Dejean (Coleoptera, Dytiscidae, Colymbetinae). *Zootaxa* 4258 (1): 91–100. <https://doi.org/10.11646/zootaxa.4258.1.7>

Balke M, García M, Hendrich L (2019) Two new species of diving beetles from the Duida-Marahuaca Tepui in Venezuela (Coleoptera: Dytiscidae: Colymbetinae). *Russian Entomological Journal* 28 (3): 258–262.

Balke M, Ospina-Torres R, Suarez Megna Y, Laython M, Hendrich L (2019b) A new species of *Rhantus* Dejean, 1833 diving beetles from the wetlands of the City of Bogota and surroundings (Coleoptera, Dytiscidae, Colymbetinae). *Alpine Entomology*.

Bustamante N (2018) Registro de los coleópteros acuáticos en la región Cusco, Perú. *The Biologist* (Lima) 16 (1): 35–49. <https://doi.org/10.24039/rtb2018161220>

Guignot F (1955) Description de nouveaux Dytiscidae principalement de l'Amérique du Sud. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* 31 (27): 1–12.

Brancucci M, Hendrich L (2008) 5100 m above sea level: *Agabus joachimschmidti* sp. n. and notes on other high altitude diving beetles from Tibet and Bhutan (Coleoptera, Dytiscidae). *Zootaxa* 1825: 51–58. <https://doi.org/10.11646/zootaxa.1825.1.5>

Miller KB, Bergsten J (2016) Diving beetles of the world: systematics and biology of the Dytiscidae. John Hopkins University Press, Baltimore, 320 pp.

Morinière J, Michat C, Jäch MA, Bergsten J, Hendrich L, Balke M (2015) Anisomeriini diving beetles—an Atlantic–Pacific Island disjunction on Tristan da Cunha and Robinson Crusoe Island, Juan Fernández? *Cladistics* 31 (2): 166–176. <https://doi.org/10.1111/cla.12074>

Morinière J, Van Dam MH, Hawlitschek O, Bergsten J, Michat MC, Hendrich L, Ribera I, Toussaint EF, Balke M (2016) Phylogenetic niche conservatism explains an inverse latitudinal diversity gradient in freshwater arthropods. *Scientific Reports* 6: 26340. <https://doi.org/10.1038/srep26340>

Nilsson AN, Hájek J (2019) A world catalogue of the family Dytiscidae, or the diving beetles (Coleoptera, Adephaga). Version 1.1.2019. <http://www.waterbeetles.eu>. Accessed on: 2019-7-16.